Wı-DG

Wıfı Dongle for accessing miniDSP devices through the network

User Manual

![miniDSP logo]

![miniDSP logo]

![miniDSP logo]
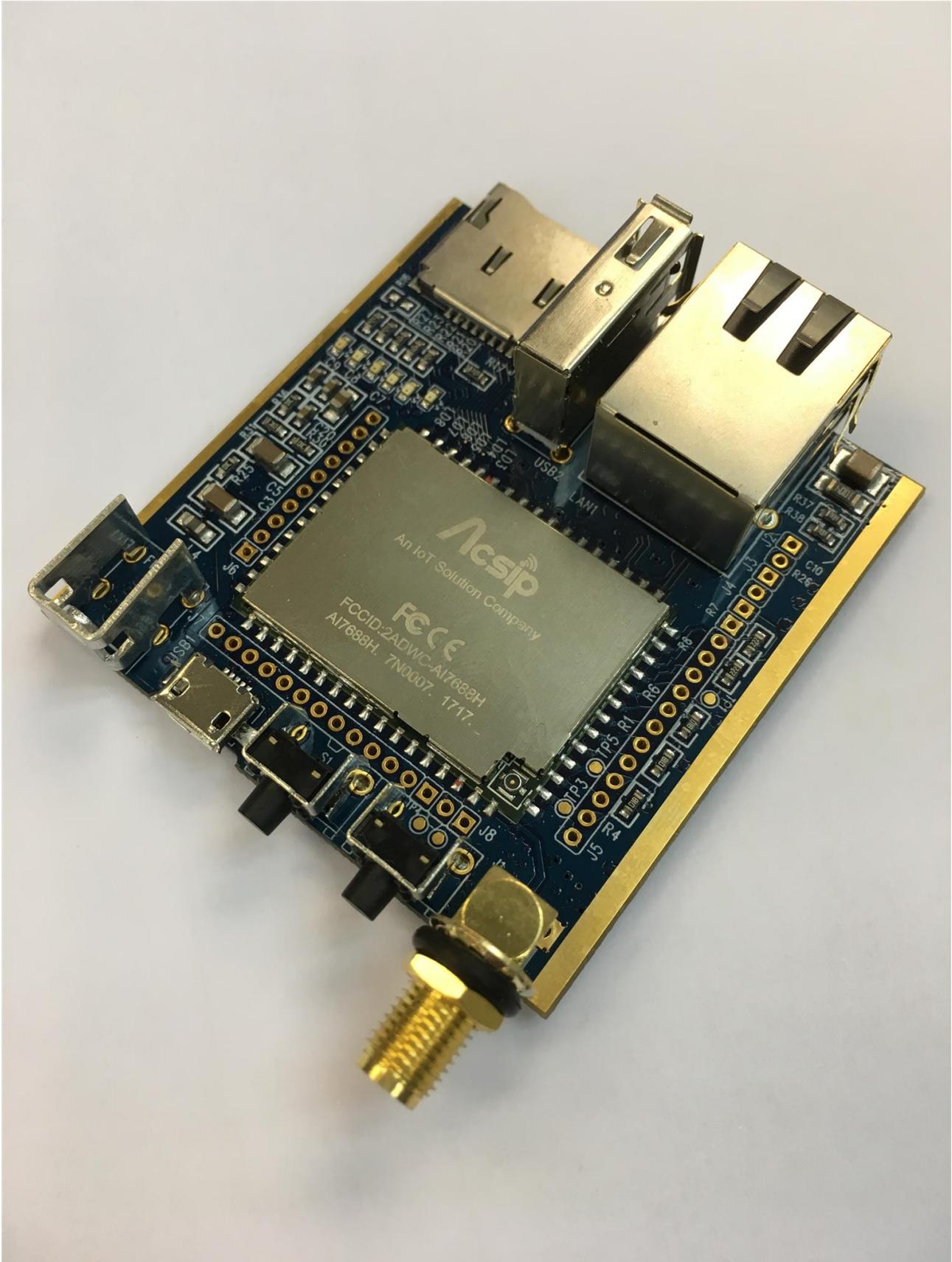
Revision history

Revision	Description	Date
V1.0	First version	9 Jan 2018
V1.1	Updated url to access the device's management console	27Apr2018
V1.2	Added FCC statement	7May2018
V1.3	Updated TOC and antenna side photo	9May2018

CONTENTS

miniDSP

IMPORTANT INFORMATION

Please read the following information before use. In case of any questions, please contact miniDSP via the support portal at minidsp.desk.com.

SYSTEM REQUIREMENTS

To configure the Wi-DG and use it with the minidsp plugins and hardware, you will require a Windows PC or Apple Mac OS X computer with the following minimum specification:

Windows

- PC with 1GHz or higher processor clock speed. Intel® Pentium®/Celeron® family, or AMD K6®/AMD Athlon®/AMD Duron® family, or compatible processor recommended.
- 512 megabytes (MB) of RAM or higher
- Keyboard and mouse or compatible pointing device
- USB 2.0 port
- Network accessibility through Wifi or Ethernet cable
- Microsoft• ® Windows® Vista® SP1/ XP pro SP2/Win7/Win8.1/Win10
- Microsoft• ® .NET framework v3.5 or later
- Adobe AIR environment (latest version)
- Adobe Flash player (latest version)
- A web browser (e.g. IE, Chrome, etc)
- Bonjour print service (For Windows 7 only)

Mac OS X

- Intel-based Mac with 1 GHz or higher processor clock speed
- 512 megabytes (MB) of RAM or higher
- Keyboard and mouse or compatible pointing device
- USB 2.0 port
- Network accessibility through Wifi or Ethernet cable
- Mac OS X 10.8 or higher
- Adobe AIR environment (latest version)
- Adobe Flash player (latest version)
- A web browser (e.g. Safari)

DISCLAIMER/WARNING

miniDSP cannot be held responsible for any damage that may result from the improper use of this product or incorrect configuration of its settings. As with any other product, we recommend that you carefully read this manual and other technical notes to ensure that you fully understand how to operate this product. The miniDSP

audio processor is a powerful tool, and misuse or misconfiguration, such as incorrectly set gains or excessive boost, can produce signals that may damage your audio system.

As a general guideline, you should perform the initial configuration of the miniDSP audio processor before enabling audio through any connected output device or amplification. Doing so will help ensure that the software is correctly configured.

Finally, note that the miniDSP audio processor is a very flexible device, and many of the questions we receive at the tech support department are already answered in this user manual and in the online application notes on the miniDSP.com website. So please take the time to carefully read this user manual and the online technical support. Thanks for your understanding!

WARRANTY TERMS

miniDSP Ltd warrants this product to be free from defects in materials and workmanship for a period of one year from the invoice date. Our warranty does not cover failure of the product due to incorrect connection or installation, improper or undocumented use, unauthorized servicing, modification or alteration of the unit in any way, or any usage outside of that recommended in this manual. If in doubt, contact miniDSP prior to use.

FCC CLASS B STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Warning: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice: Shielded interface cable must be used in order to comply with emission limits.

Notice: Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device is acting as slave and operating in the 2.4 GHz (2412 ~ 2462 MHz) band. Ad Hoc function is supported but not able to operate on non-US frequencies.

FCC Radio Frequency Exposure Statement

The device has been evaluated to meet general RF exposure requirements. The device can be used in fixed/mobile exposure conditions. The min separation distance is 20cm.

CE Mark Statement

The Wi-DG has passed the test performed according to European Standard EN 55022 Class B.

A note on this manual

This User Manual is designed for reading in both print and on the computer. If printing the manual, please print double-sided. The embedded page size is 8 ½" x 11". Printing on A4 paper will result in a slightly reduced size.

1 PRODUCT OVERVIEW

Thank you for choosing the Wi-DG. The Wi-DG is a tiny adaptor enabling control of a minidsp device through Ethernet or WiFi network. This device allows you to have extra connection options besides the USB connection provided in most of the minidsp products.

1.1 THE WI-DG CONCEPT

The Wi-DG provides a USB host port for connection to a minidsp hardware with a USB cable. With Wi-DG installed in the same network as a PC, users can control the minidsp hardware with Wi-DG acting as a WiFi-to-USB bridge, using the software plugin (the plugin need to have device discovery feature, see section 1.3 for list of plugins and versions supported) installed on that PC.

Router

Wi-DG

(Station mode)

USB

minidsp hardware
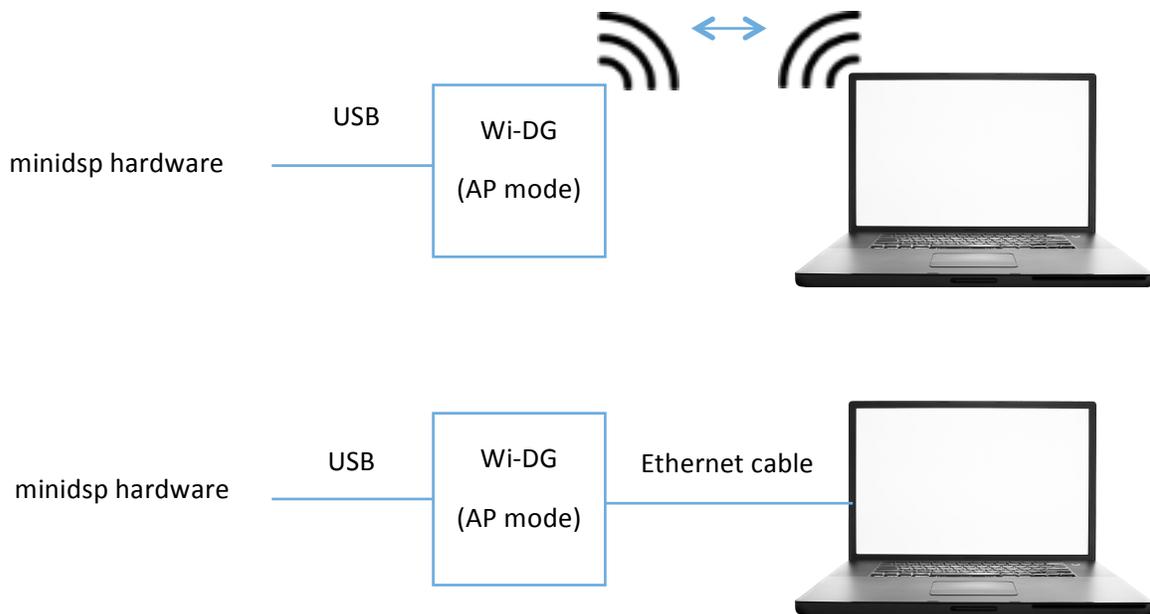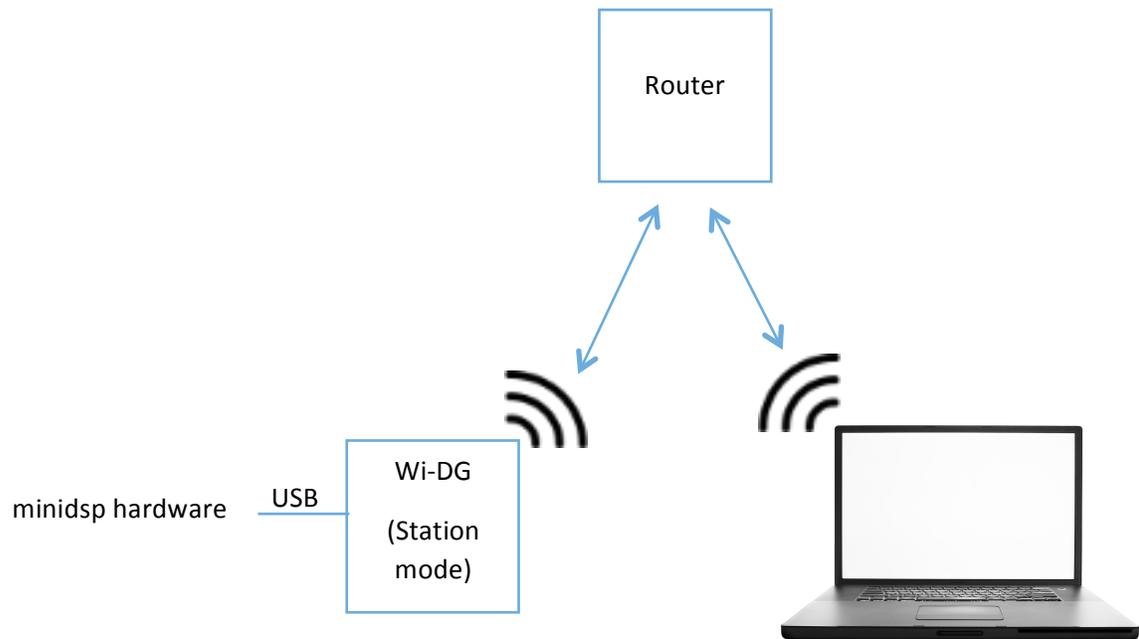
1.2 THE HARDWARE OVERVIEW

1.2.1 I/O Panel
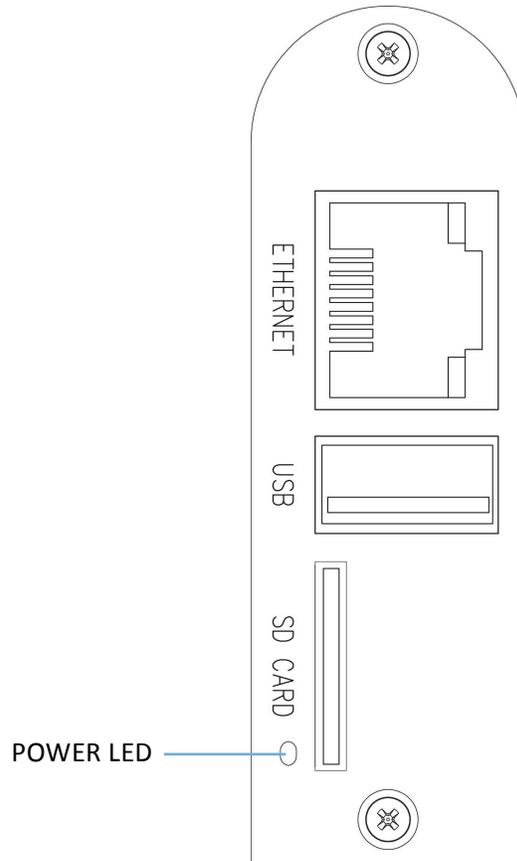
ETHERNET	For directly access to Wi-DG via Ethernet. When connected directly to PC with DHCP enabled, the PC will obtain a local IP address of 192.168.100.x and will be in the same sub-net as Wi-DG. Users can manage the settings of Wi-DG through the url: http://minidsp-wi-dg.local with a web browser
USB	The USB host port where a powered minidsp hardware will plug into
SD CARD	SD card slot reserved for future use
POWER LED	Green LED light up indicates the device is powered up

1.2.2 Power and Buttons Panel
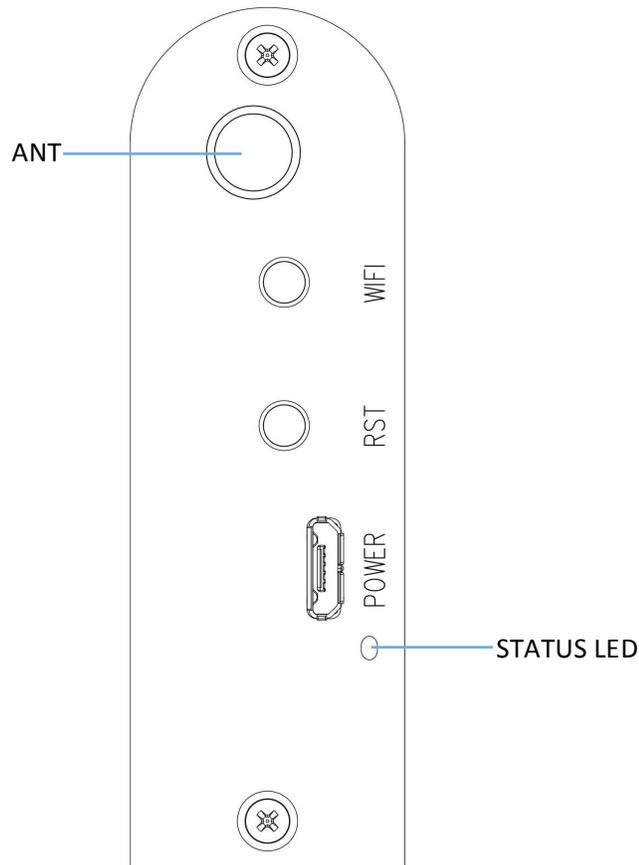
ANT   Antenna port for installing an antenna for wifi access

WIFI   A restore to factory default button. Press-and-hold it for 20 seconds and then release, the Wi-DG will restore to the chipset factory default. After restore to default, all settings and password will be lost and the program files inside the Wi-DG for controlling minidsp hardware will be deleted. To re-enable the Wi-DG to its original newly purchased state, follow the steps in section 4.2 – "Device Recovery" to copy the program files into the Wi-DG

RST   A reset device button. Press it once will reboot the Wi-DG

POWER   A micro-usb port where the 5V power is applied from a power adapter or from a USB port on a PC

STATUS LED   Green color once boot up. Blink 3 times per second in amber color when Wi-DG is in AP mode and a PC was associated with ("connected to") it. In station mode, it will blink once per second in amber color and after the Wi-DG is associated ("connected") with a wifi network, the LED will blink as data is transmitting

1.3 SUPPORTED PLUGINS AND MINIDSP HARDWARE

The Wi-DG can work with the following hardware with plugin support:

- MiniSharc-4x8
- OpenDRC-2x2
- nanoAVR-HD
- MiniDSP-2x4-HD

The Wi-DG can work with the following hardware **but plugin support is not available yet**:

- MiniDSP-2x8
- MiniDSP-8x8
- MiniDSP-2x8-nanoDIGI
- C-DSP-6x8
- DDRC-22
- DDRC-88BM
- DDRC-24
- nanoAVR-DL

The Wi-DG can work with the following plugins (more plugins will be added to the list as we push the update):

- MiniDSP-2x4-HD plugin v1.10 or above
- miniSHARC-4x8 plugin v1.10 or above
- miniSHARC-4x8-96k plugin v1.10 or above
- OpenDRC-2x2 plugin v2.5 or above
- nanoAVR-BM plugin v1.11 or above

2 HARDWARE SETUP

The Wi-DG can operate in one of the two modes: AP mode or Station mode. The Wi-DG is in AP mode by default at the time of purchase. Users should decide first on which mode they would like the Wi-DG to operate before going through the relevant section below. Once configured, the device will keep in the selected mode through every power on/off or reboots cycle.

2.1 AP MODE

In this mode, the Wi-DG will act like an access point where a PC can connect to it via wifi. This mode is especially useful in the context where there is no wifi router installed, e.g. inside a car.

Follow the steps below to setup the Wi-DG into AP mode:

1. Install the antenna onto the antenna port of Wi-DG

2. Connect a minidsp device to the USB port on Wi-DG with an USB cable

3. Connect a PC to the Ethernet port on Wi-DG directly with an Ethernet cable

4. Plug in the micro-USB cable to the POWER port to apply 5V power to the Wi-DG
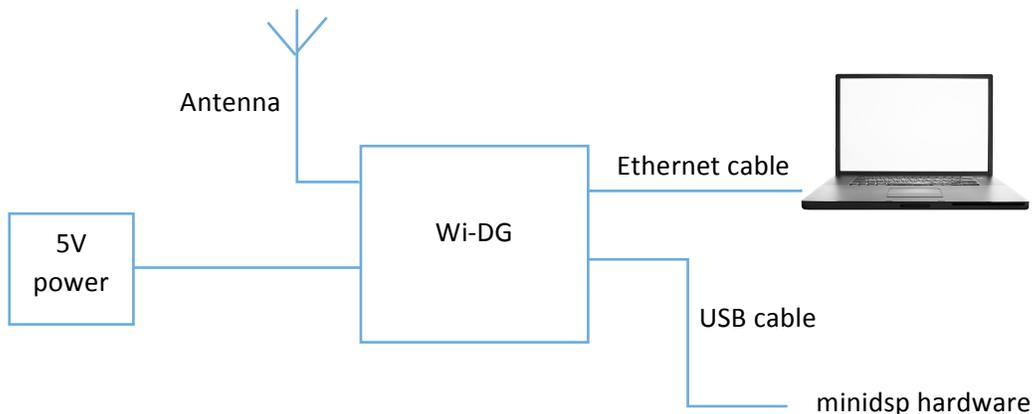
5. Open a web browser and type in the url: http://minidsp-wi-dg.local , a screen will appear for login to the Wi-DG management console. (Note: the discovery of Wi-DG by the web browser requires mDNS support which should be available in Windows 8 or above and Mac OS. For windows 7, because of the lack of mDNS support, user has to install Bonjour print service prior to this step.)

6. Enter the password (default password is: 123456) and click the "SIGN IN" button, the "System information" page will be presented.
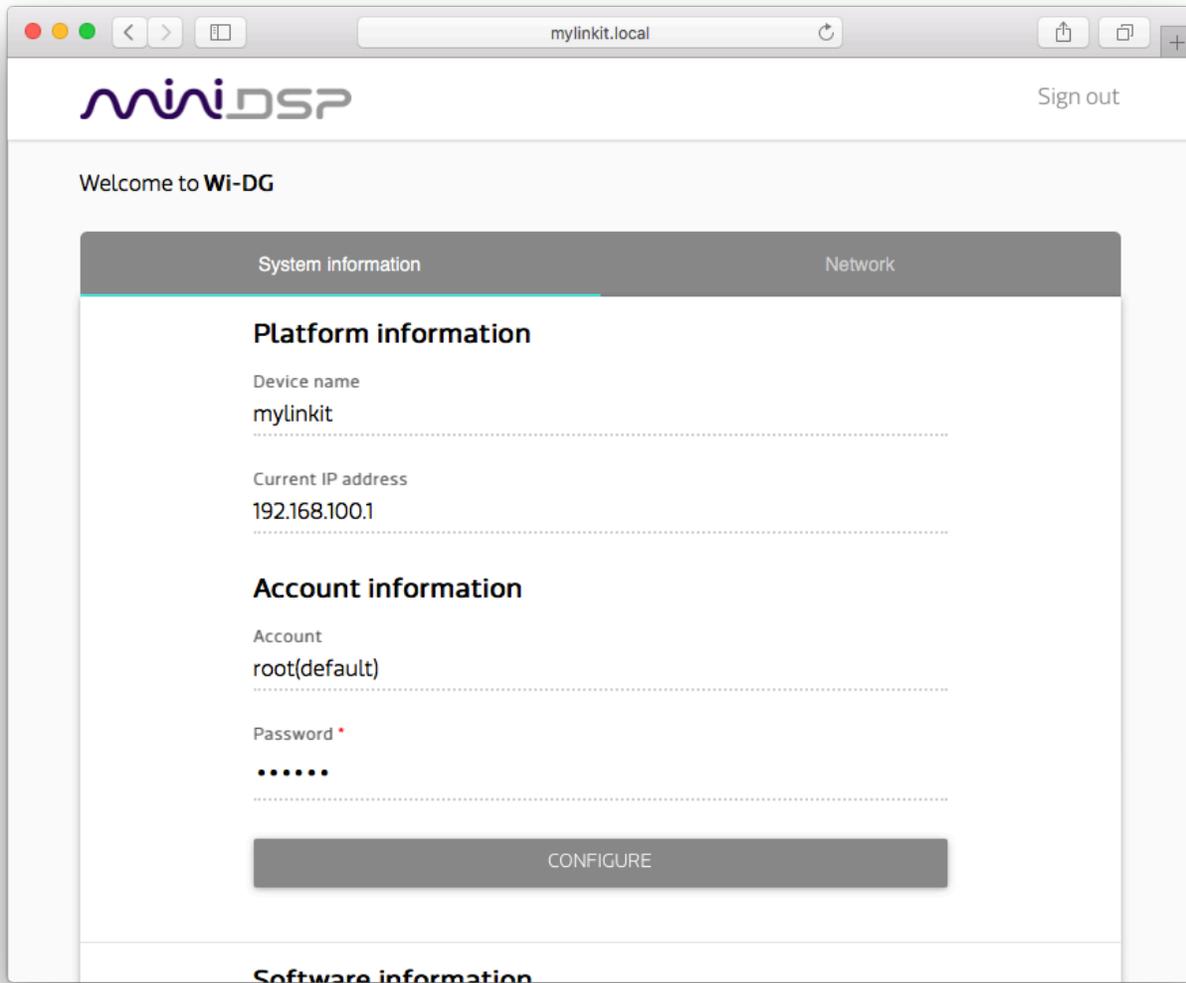
7. Click the "Network" tab on the top and the "Network setting" will be presented.

8. Click the "AP mode" radio button and enter the name and password for accessing to the Wi-DG if required. In this example, the AP is named "LinkIt_Smart_7688_XXXXXX" with no password is used for simplicity. Where XXXXXX is the serial hex number, each device has different serial hex number.
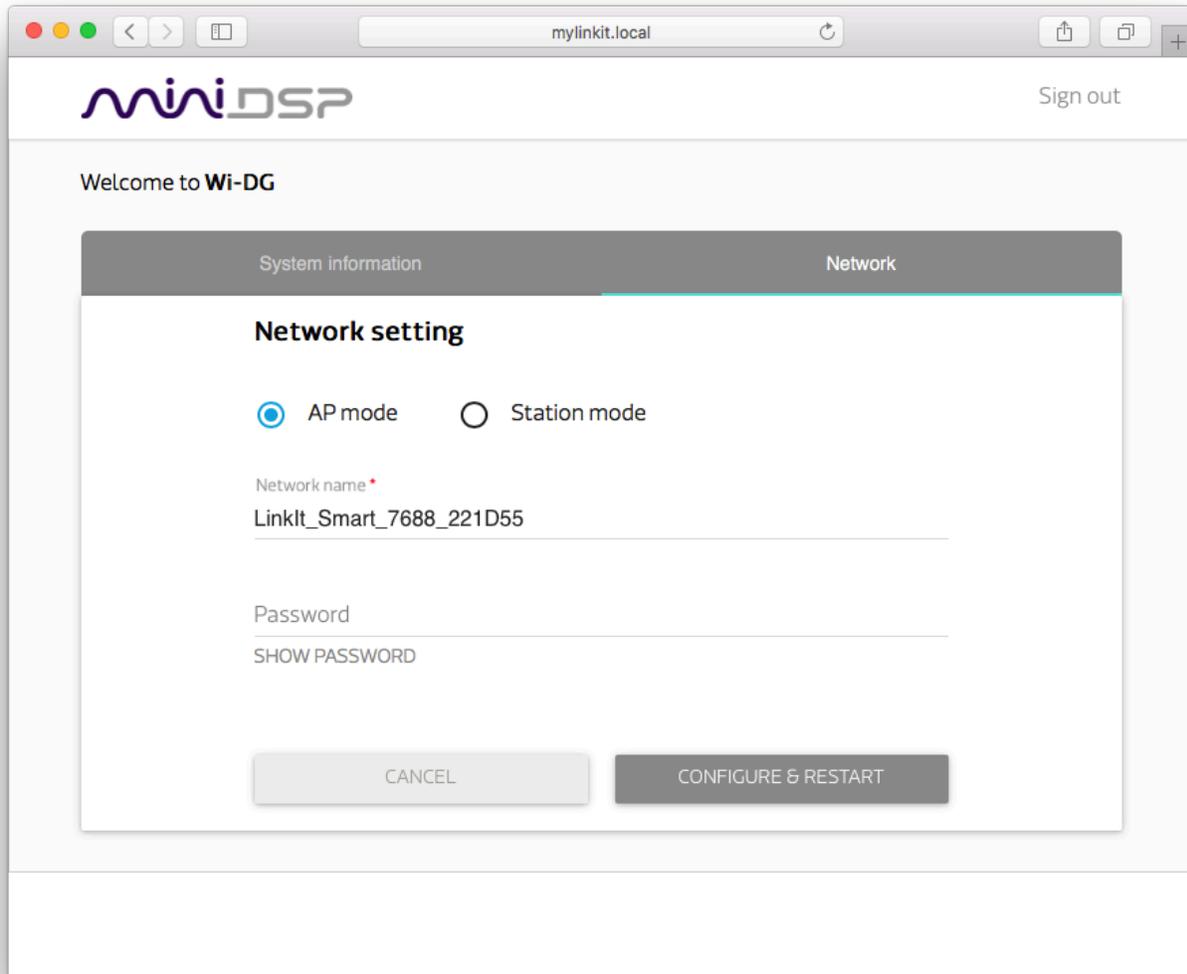
9. Click "CONFIGURE & RESTART" button to apply the settings, the Wi-DG will restart and setup in AP mode.
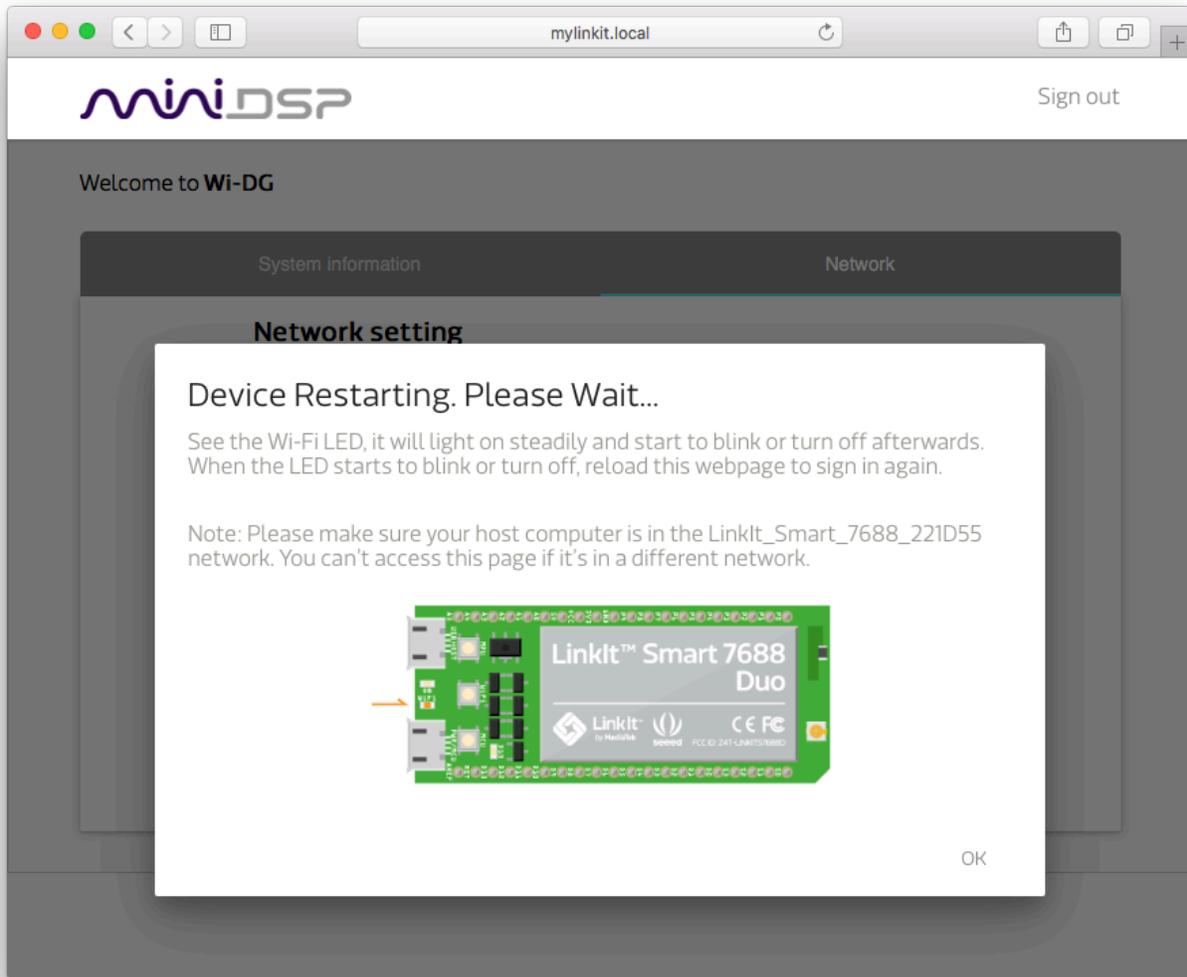
10. Unplug the Ethernet cable, turn on the wifi of your PC to search for an AP you had just named and connect to it, for our example it would be "LinkIt_Smart_7688_XXXXXX", supply the password if requested upon connect.

11. After successful connect, the status LED on the Wi-DG should blink 3 times per second in amber color. You can run the plugin for the minidsp device, which is plugged in to the USB port of Wi-DG and follow the steps in Section 3 to discover the device from the plugin and do the setup or control.

2.2 STATION MODE

In this mode, the Wi-DG will act like a wifi client, which requires a wifi router for it to access so that it can join a network. The PC can then join to the same network via the same wifi router and make connection the Wi-DG. This mode is useful in the context where there is a wifi router installed, e.g. inside home.

Follow the steps below to setup the Wi-DG into Station mode:

1. Install the antenna onto the antenna port of Wi-DG

2. Connect a minidsp device to the USB port on Wi-DG with an USB cable

3. Connect a PC to the Ethernet port on Wi-DG directly with an Ethernet cable

4. Plug in the micro-USB cable to the POWER port to apply 5V power to the Wi-DG

5. Open a web browser and type in the url: http://minidsp-wi-dg.local , a screen will appear for login to the Wi-DG management console. (Note: the discovery of Wi-DG by the web browser requires mDNS support which should be available in Windows 8 or above and Mac OS. For windows 7, because of the lack of mDNS support, user has to install Bonjour print service prior to this step.)

Welcome to **Wi-DG**.

Account
root(default)

Password *

••••••

SHOW PASSWORD

SIGN IN

6. Enter the password (default password is: 123456) and click the "SIGN IN" button, the "System information" page will be presented.

![miniDSP logo]

7. Click the "Network" tab on the top and the "Network setting" will be presented.

8. Click the "Station mode" radio button and select a wifi SSID from the "Detected Wi-Fi Network" which the Wi-DG will be associated with. Also, enter the password for accessing to the selected wifi.
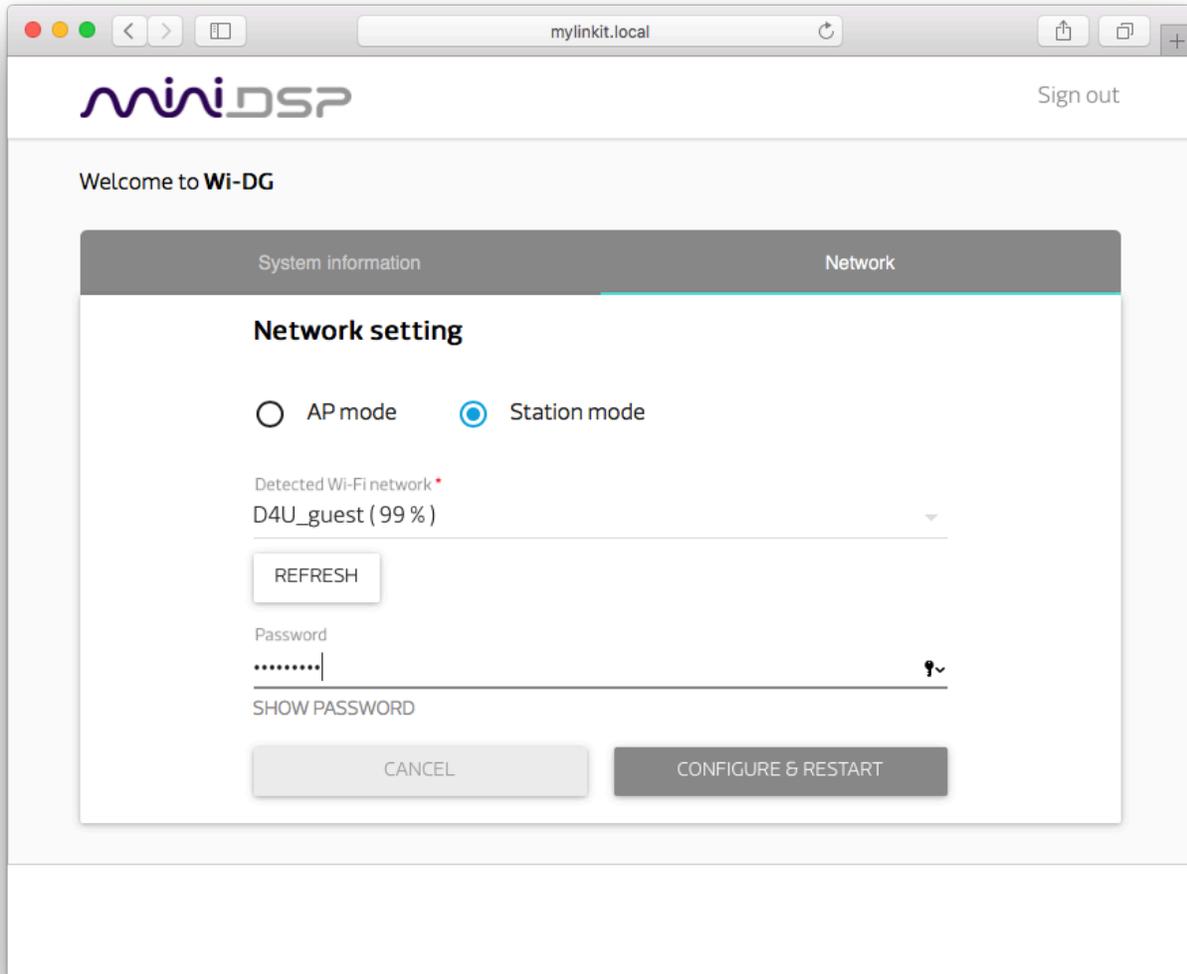
9. Click "CONFIGURE & RESTART" button to apply the settings, the Wi-DG will restart and setup in station mode.

10. Unplug the Ethernet cable, turn on the wifi of your PC to search for the wifi router SSID you had just selected in the "Detected Wi-Fi Network" of the Wi-DG management console, for our example it would be "D4U_guest", supply the password if requested upon connect.

11. After successful connect, the status LED on the Wi-DG should blink as data is transmitting in amber color. You can run the plugin for the minidsp device, which is plugged in to the USB port of Wi-DG and follow the steps in Section 3 to discover the device from the plugin and do the setup or control.

3 PLUGIN SETUP

After the Wi-DG was setup as described in Section 2 into one of the two modes: AP mode or Station mode. Users can connect to the minidsp device using the plugin installed on a PC and do the setup.

3.1 DISCOVER THE MINIDSP DEVICE'S IP ADDRESS

Open a minidsp plugin and note there is a text field called "IP address" with a checkbox "Auto" next to it.

The layout could be in either of the two format below:

 OR

Check the "Auto" checkbox will allow the plugin to detect the presence of a minidsp device, which is plugged to a Wi-DG in the network.

After a while, the ip address of the Wi-DG with the minidsp device plugged will be automatically filled into the "IP address" textbox. That means the device is ready to be connect with this plugin.

3.2 CONNECT TO THE MINIDSP DEVICE FOR CONTROL

When an ip address was filled into the "IP address" field just like the previous section, the "Connect" button can be clicked to connect to the minidsp device for settings and control.

Please note that, if nothing was filled in the "IP address" field and the "Connect" button was clicked, the plugin will, by default, try to connect to the minidsp device through USB directly, but not connected to minidsp device through the Wi-DG on the network.

4 ADDITIONAL INFORMATION

4.1 SPECIFICATIONS

micro-USB port	5V power input
USB host port	USB 2.0 host port for plug in a minidsp device
Ethernet port	10/100 Fast Ethernet interface
Wi-Fi radio	1T1R 802.11n 2.4GHz RF
micro-SD card port	SD-XC (class 10)
Power supply	5 V DC
Dimensions **(Antenna port excluded, H x W x D)**	68 x 64 x 24 mm

4.2 DEVICE RECOVERY

In case there are errors in the settings of the Wi-DG that had caused it failed to function or the password to access the web management console was forgotten. The recovery steps described below can be followed to restore the device into default state. (In default state, login account name is: root, the password needs to be setup by yourself)

4.2.1 Windows

1. Connect the Wi-DG to PC with an Ethernet cable.

2. Power up the Wi-DG, wait until the status LED blinks with amber color, that is the unit is either in AP mode or Station mode.

3. Press-and-hold the "WIFI" button for at least 20 seconds and then release, the status LED should blink quickly in amber color for several seconds, the device will reboot and restore to factory default state.

4. Unzip the Wi-DG program software package to your PC. The folder structure of the package is shown below:
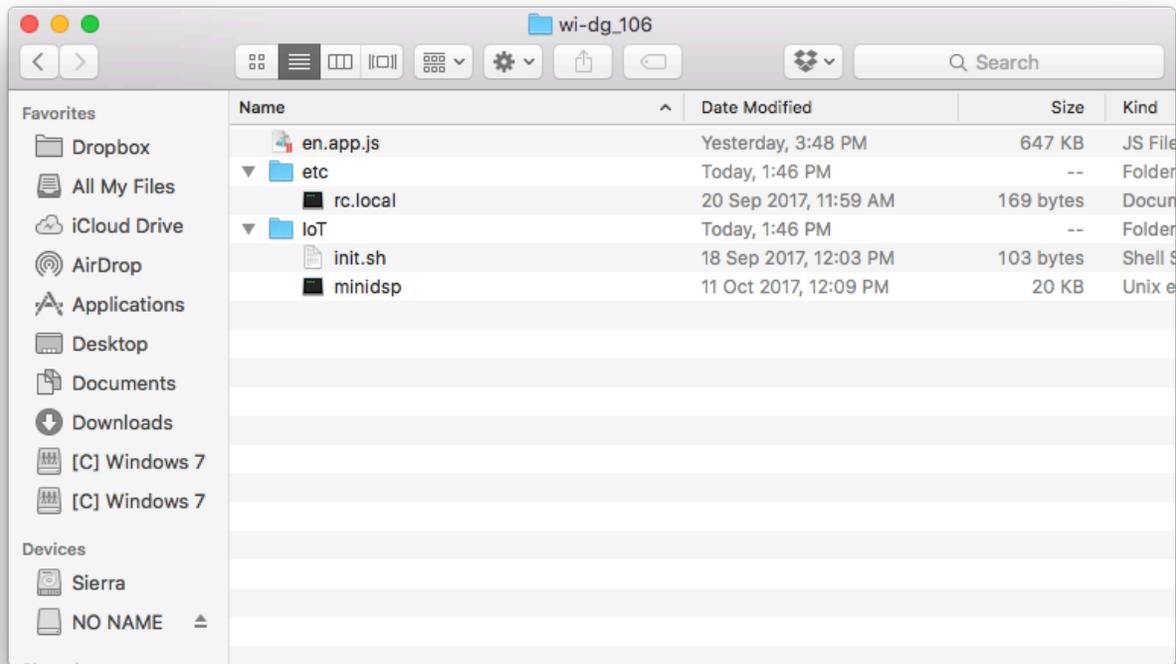
5. Clear the browser cache of your web browser. Type the url: http://minidsp-wi-dg.local and hit the "Enter" key. A login interface is display for setting a new password.
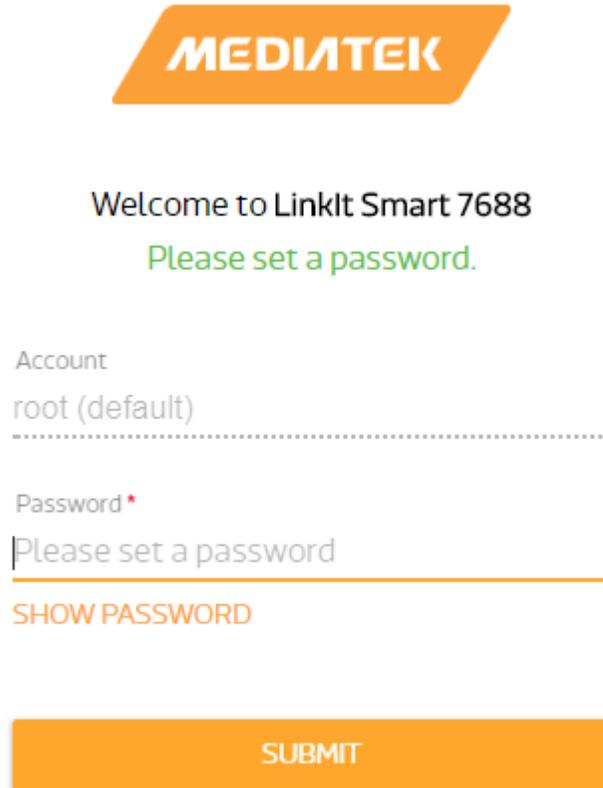
MEDIATEK

Welcome to LinkIt Smart 7688
Please set a password.

Account
root (default)

Password *
Please set a password

SHOW PASSWORD

SUBMIT

6. Enter the password to set the password for the root account and click the "SUBMIT" button. A login interface will be displayed again. Clear the browser cache and close the web browser.

7. Download WinSCP Portable Executable and unzip it on your PC.

8. Go into WinSCP folder, run the WinSCP.exe

9. Select "SCP" as file protocol, enter host name as "minidsp-wi-dg.local" , user name as "root" and enter the password, click the "Login" button.
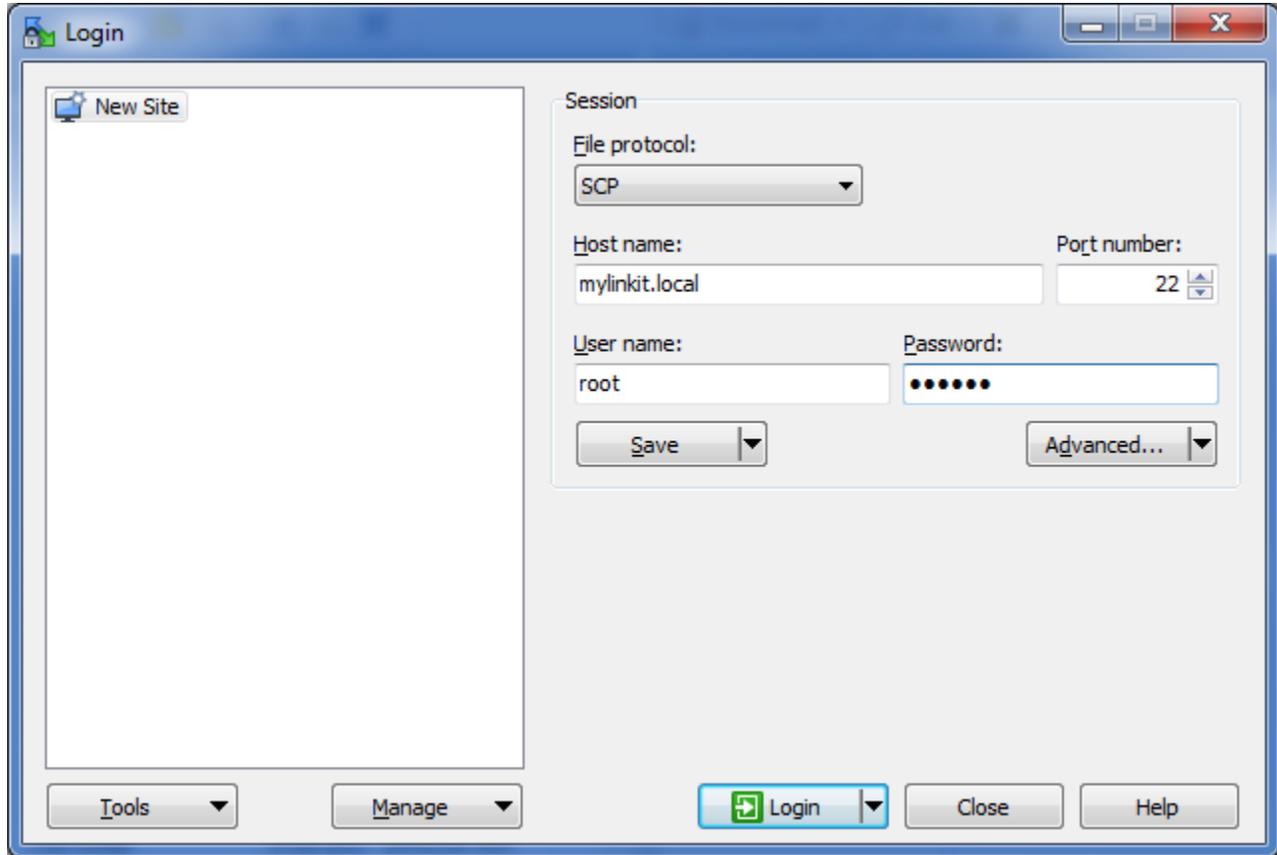
10. A security warning may pop-up, click "Add" anyway.

11. Open the "IoT" folder on the right panel, drag the "init.sh" and "minidsp" provided in wi-dg_xxx folder into this folder.
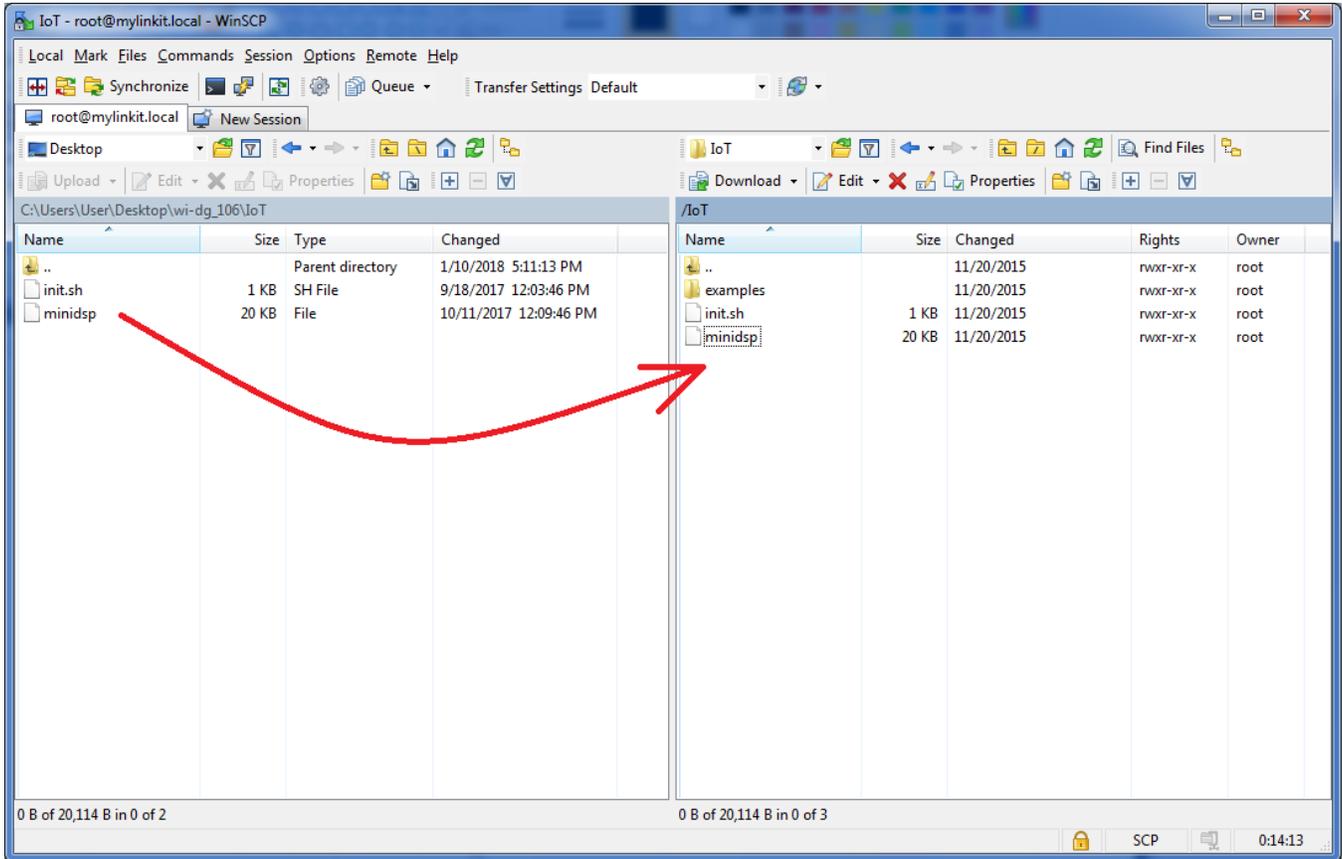
12. Go back up one level to the root directory and open the "etc" folder on the right panel.
13. Drag to replace the "rc.local" in this folder with our custom factory copy in wi-dg_xxx/etc folder.
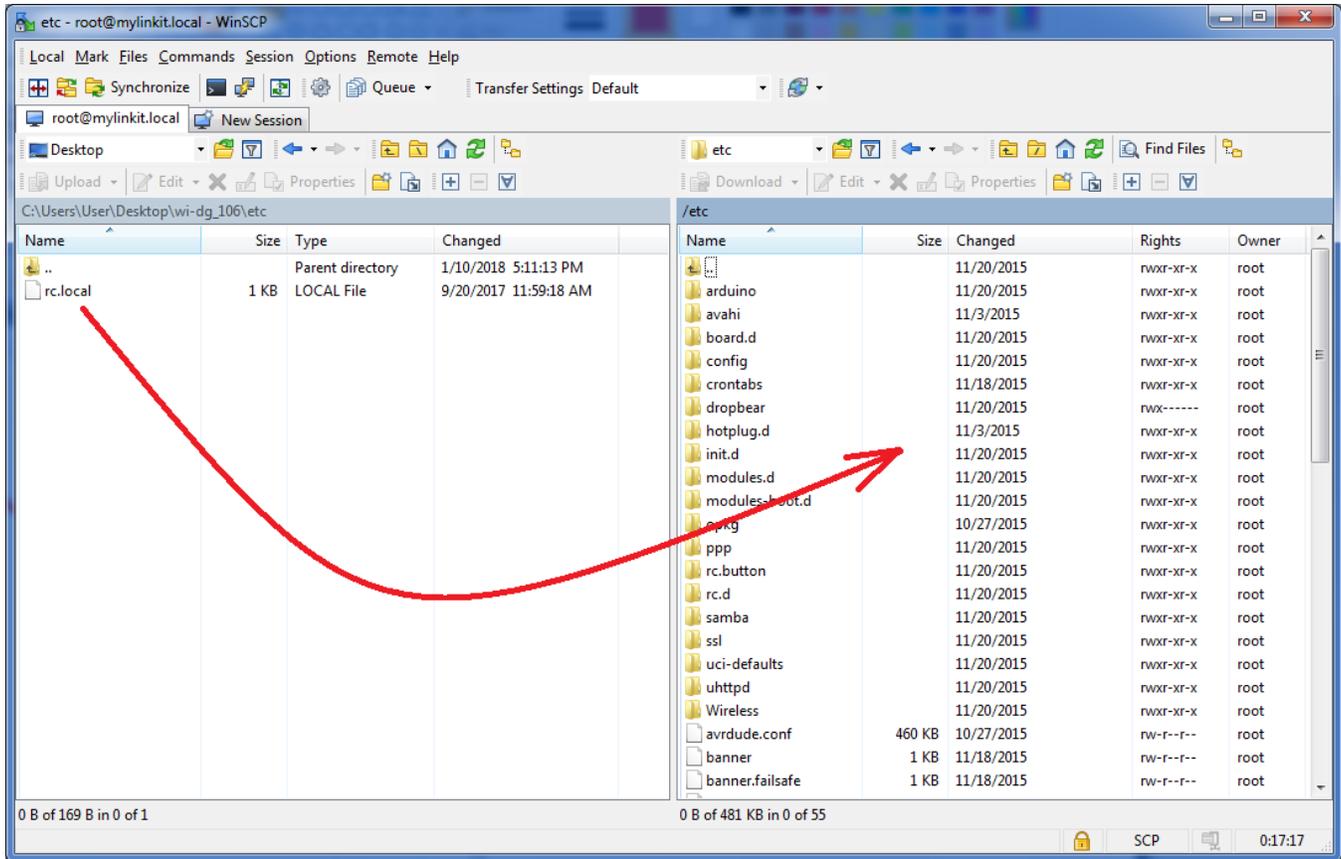
14. Go back up one level to the root directory and open the "www/build" folder on the right panel.
15. Drag to replace the "en.app.js" in this folder with our custom factory copy in wi-dg_xxx.
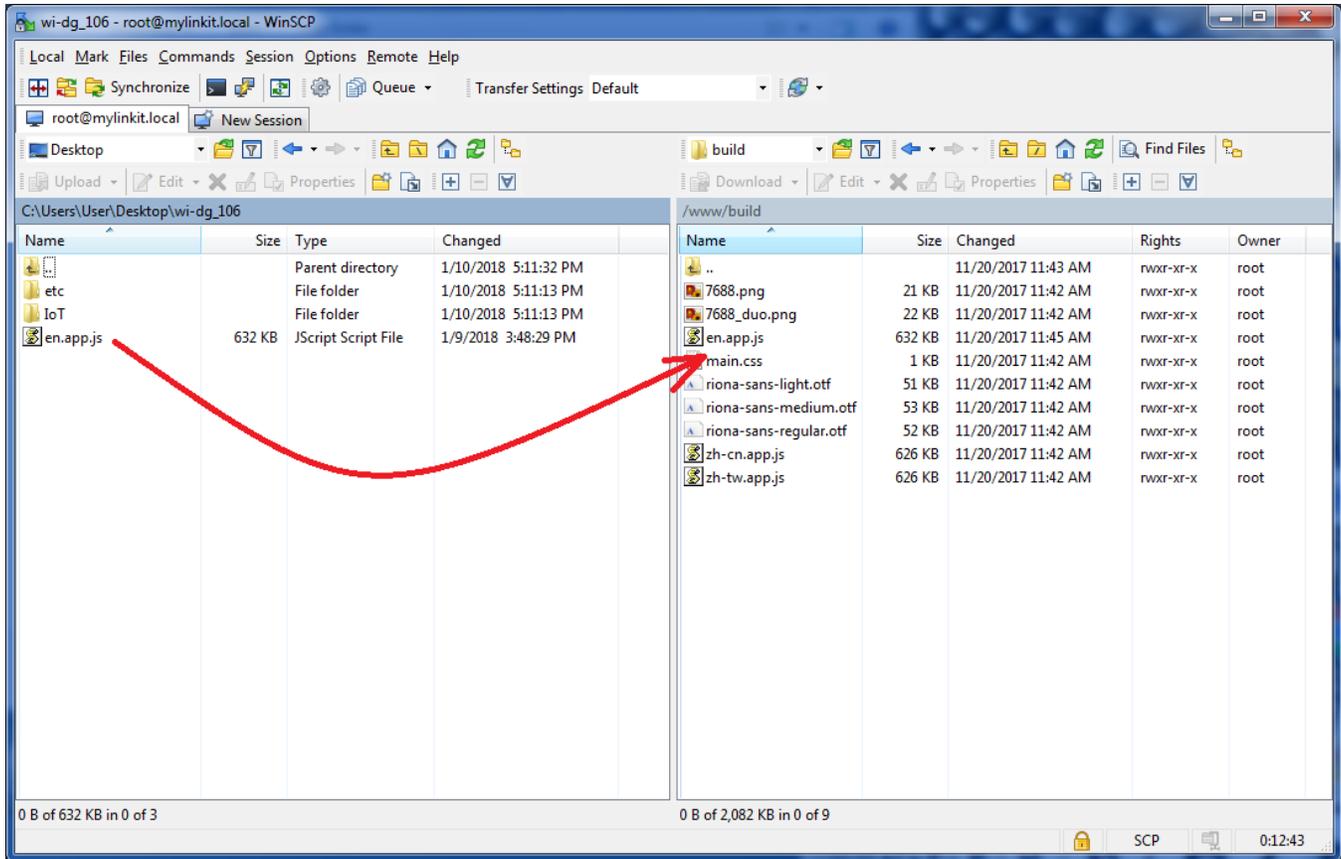
16. After the files are copied, power-cycle the device to reboot it.

17. Type the url: http://minidsp-wi-dg.local and hit the "Enter" key and then login to the web management console to setup the Wi-DG into either AP mode or Station mode again.

4.2.2 Mac

1. Connect the Wi-DG to PC with an Ethernet cable.

2. Power up the Wi-DG, wait until the status LED blinks with amber color, that is the unit is either in AP mode or Station mode.

3. Press-and-hold the "WIFI" button for at least 20 seconds and then release, the status LED should blink quickly in amber color for several seconds, the device will reboot and restore to factory default state.

4. Unzip the Wi-DG program software package to your PC. It was extracted to Home folder for this example. The folder structure of the package is shown below:
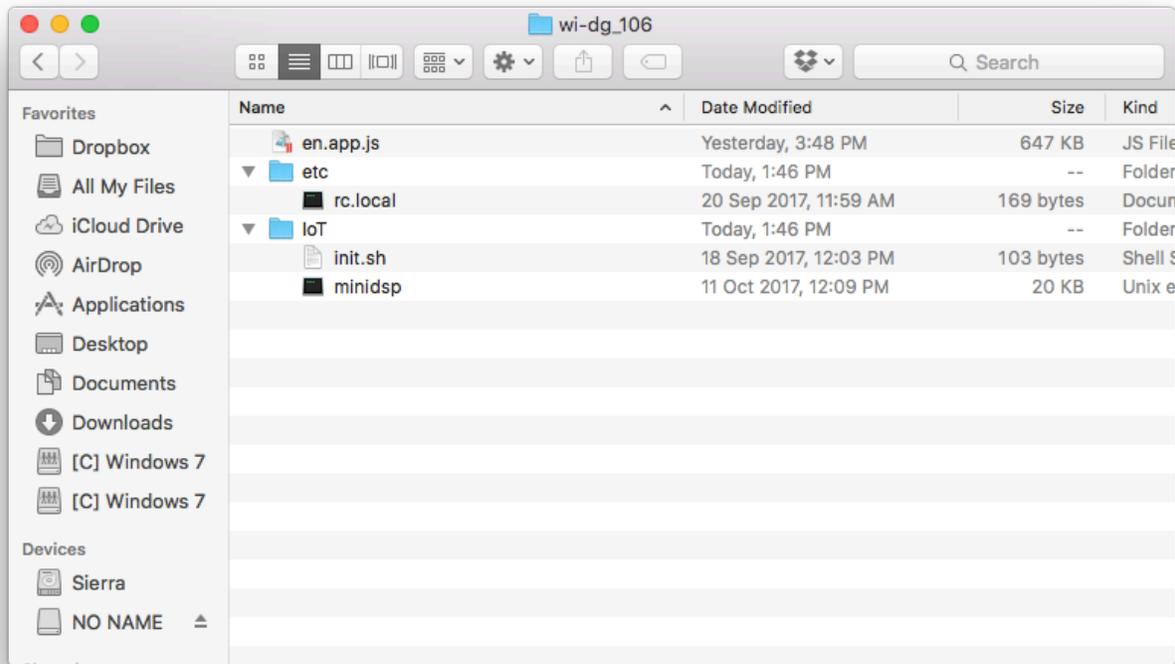
5. Clear the browser cache of your web browser. Type the url: http://minidsp-wi-dg.local and hit the "Enter" key. A login interface is display for setting a new password.
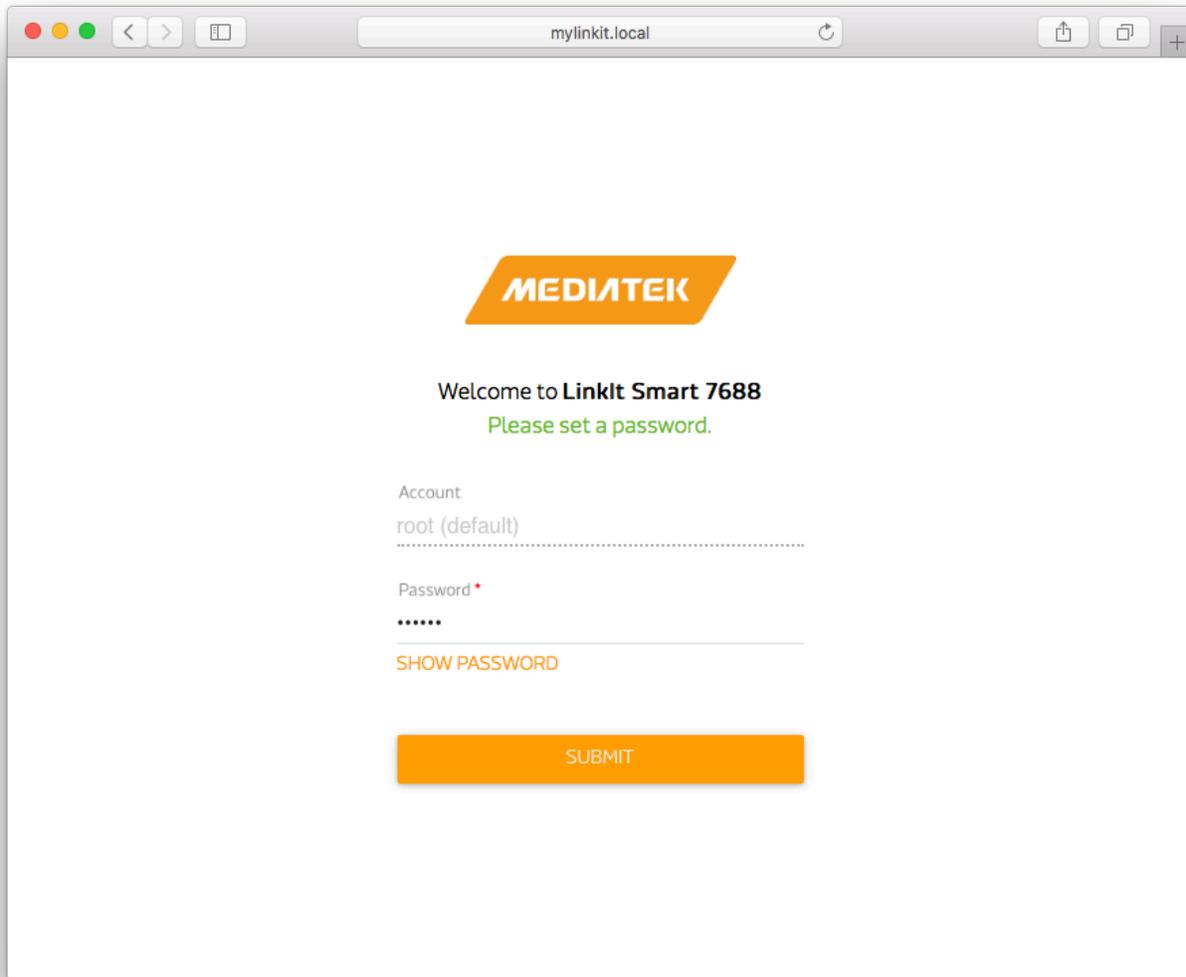
6. Enter the password to set the password for the root account and click the "SUBMIT" button. A login interface will be displayed again. Clear the browser cache and close the web browser.

7. In Mac, select "Go" -> "Utilities" -> "Terminal", a terminal console will be displayed.

8. Enter the following command one-by-one to copy the files from wi-dg_xxx folder to Wi-DG, each line of command will required you to enter the password to login as root (for the example below, assume the wi-dg_106 folder is in the current directory, i.e. home directory):

   scp ./wi-dg_106/en.app.js root@minidsp-wi-dg.local:/www/build/

   scp -r ./wi-dg_106/etc root@minidsp-wi-dg.local:/

scp -r ./wi-dg_106/IoT root@minidsp-wi-dg.local:/

Note upon entered the first line of command, user may be prompted with the following words, if this is the case type 'yes' and hit "Enter" key to continue:

```
The authenticity of host 'minidsp-wi-dg.local (192.168.100.1)' can't be
established.
RSA key fingerprint is SHA256:i7jxcpG6W/8NfZolSGFCvnJ/B1p+sasWnp9ba/4iaY3.

Are you sure you want to continue connecting (yes/no)?
```

In cases where there are two or more Wi-DGs that have been connected with this computer, upon entered the first line of command, user may be prompted with the following error because the host key does not match the key in the known_hosts file, if this is the case, there are two ways to fix:

1. Issue the command:

   ssh-keygen –r minidsp-wi-dg.local

   to generate a new host key that maps to minidsp-wi-dg.local

2. cd into /Users/<username> and then issue the command:

   rm .ssh/known_hosts

   to delete the known_hosts file

```
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@    WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!    @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that a host key has just been changed.
The fingerprint for the RSA key sent by the remote host is
SHA256:i7jxcpG6W/8NfZolSGFCvnJ/B1p+sasWnp9ba/4iaY3.
Please contact your system administrator.
Add correct host key in /Users/<username>/.ssh/known_hosts to get rid of
this message.
Offending RSA key in /Users/<username>/.ssh/known_hosts:1
RSA host key for minidsp-wi-dg.local has changed and you have requested
strict checking.

Host key verification failed.
```

9. After the files are copied, power-cycle the device to reboot it.

10. Type the url: http://minidsp-wi-dg.local and hit the "Enter" key and then login to the web management console to setup the Wi-DG into either AP mode or Station mode again.

4.3 OBTAINING SUPPORT

1. Check the forums on miniDSP.com to see if this issue has already been raised and a solution provided.

2. Contact miniDSP via the support portal at minidsp.desk.com with:

    a. The specific product you are having an issue with (in this case, Wi-DG or accessories).

    b. A clear explanation of the symptoms you are seeing.

Please note that miniDSP is only able to provide support for the hardware and functions documented in this manual, and only for problems specifically related to the miniDSP hardware and software functions. Any other items, such as designing or debugging your I2S interface circuitry or layout or interfaces to third-party hardware, are specifically excluded from the scope of miniDSP support.